Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

August 10, 2001

TVA-BFN-TS-412

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1, 2, AND 3 - TECHNICAL SPECIFICATIONS (TS) CHANGE 412 - FUEL MOVEMENT WITH INOPERABLE REFUELING EQUIPMENT INTERLOCKS - (TAC NOS. MB2590, MB2591, AND MB2592)

Pursuant to 10 CFR 50.90, TVA is submitting a request for a TS change (TS-412) to licenses DPR-33, DPR-52, and DPR-68 for BFN. The proposed TS change would allow fuel movement to continue if the refueling interlocks are inoperable provided that a control rod withdrawal block is placed in effect and all control rods are verified to be fully inserted. Taking these actions ensures that fuel loading will not occur with a control rod withdrawn.

Attachment 1 is a description and justification for the proposed TS change, and also includes the No Significant

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Hazards Consideration and the Environmental Consideration. Attachment 2 contains marked-up pages from the current TS and TS Bases showing the proposed TS revisions. Attachment 3 provides retyped TS and TS Bases pages showing the revisions.

Similar TS changes have been approved for Perry Nuclear Power Plant, Vermont Yankee Nuclear Power Station, Dresden Nuclear Power Station, LaSalle County Station, and Quad Cities Nuclear Power Station.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). The BFN Plant Operations Review Committee and the Nuclear Safety Review Board have reviewed these proposed changes, and determined that operation of BFN Units 1, 2, and 3 in accordance with the proposed changes will not endanger the health and safety of the public. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and attachments to the Alabama State Department of Public Health.

TVA is requesting approval of this change prior to the beginning of next Unit 3 refueling outage, which is scheduled to begin in Spring 2002, and that it be made effective within 60 days of issuance to allow an orderly implementation of any needed plant procedures or training.

There are no regulatory commitments associated with this submittal. If you have any questions concerning this proposed TS change, please contact me at (256)729-2636.

Sincerely,

T. E. Abney
Manager of Licensing
and Industry Affairs

Subscribed and sworn to before me
on this 10th day of August, 2001.

Barbara A. Blanton
Notary Public
My Commission Expires 09/22/2002

Attachments
cc: See page 4

Attachments
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Attachment 1

TS - 412
Fuel Movement with Inoperable Refueling Equipment Interlocks

Description and Justification

1.0 Introduction

This letter is a request to amend Operating Licenses DPR-33, DPR-52, and DPR-68 for Browns Ferry Nuclear Plant (BFN) Units 1, 2, and 3, respectively.

The proposed change would revise the Technical Specifications (TS) by adding alternative Required Actions to Limiting Condition for Operation (LCO) 3.9.1, Refueling Equipment Interlocks, for the condition when the refueling interlocks are inoperable. The proposed change would allow the plant to continue to perform fuel movements in the reactor vessel should the refueling equipment interlocks become inoperable.

2.0 Description of Proposed Amendment

This proposed TS change revises LCO 3.9.1, Refueling Equipment Interlocks, to provide two new alternative Required Actions for the condition when the refueling equipment interlocks are inoperable. Specifically, the TS change adds Required Actions 3.9.1.A.2.1 to immediately block control rod withdrawal and 3.9.1.A.2.2 to perform a verification that all of the control rods are fully inserted. The associated TS Bases for the new Required Actions are likewise being modified to reflect the TS changes.

Refer to the marked-up TS and Bases pages from current TS in Attachment 2 for the specific changes. Retyped TS and TS Bases pages are provided in Attachment 3. The proposed changes are identical for all three BFN Units.

3.0 Background

The refueling equipment interlocks are described in detail in Section 7.6, Refueling Interlocks, of the Updated Final Safety Analysis Report (UFSAR) and in the Bases for TS LCO 3.9.1. UFSAR Sections 14.5.4.3 and 14.5.4.4 describe the

transient analysis assumptions for the control rod removal error and fuel assembly insertion error during refueling.

TS LCO 3.9.1 requires that the refueling equipment interlocks be OPERABLE during fuel movement. If the refueling equipment interlocks are not OPERABLE, then TS Required Action 3.9.1.A.1 requires that in-vessel fuel movement be immediately suspended.

The proposed TS change would allow fuel movement to continue if the refueling interlocks were inoperable provided that a control rod withdrawal block is placed in effect (new Required Action 3.9.1.A.2.1) and that all control rods are verified to be fully inserted (new Required Action 3.9.1.A.2.2). These new Required Actions ensure that fuel loading will not occur with a control rod withdrawn. The approval of this TS would allow refueling activities to continue in the event of the failure of one or more of the refueling interlocks, while continuing to maintain a sufficient level of protection against inadvertent criticality. The change will be particularly beneficial during outages where refueling operations constitute critical path activities as a contingency provision for unexpected refuel interlock equipment problems.

The related Surveillance Requirement (SR) 3.9.1.1 (Refueling Equipment Interlocks Channel Functional Test) has a 7-day frequency. Should the 7-day SR interval become due shortly before the completion of fuel movement activities, it would also be beneficial to have the option afforded by this TS change to apply the new 3.9.1.A.2 Required Actions, rather than halting refueling activities to perform the SR, if fuel movement was on critical path for the outage. This would reduce the risk associated with halting and resumption of fuel bundle movements.

The proposed BFN TS change is similar to the proposed generic change to Standard Technical Specifications (STS) for BWR-4 plants, NUREG-1433, provided in Technical Specifications Task Force (TSTF) item TSTF-225 Revision 1, which was transmitted to NRC on November 22, 2000 (Reference 1). TSTF-225 Revision 1, in addition to adding the two new alternative Required Actions being requested in this submittal, also proposes to extend the surveillance frequency of SR 3.9.1.1 from 7 days to 30 days. However, since NRC review of TSTF-225 Revision 1 is not yet complete, this TS change request does not include the 30-day SR extension provision. Several precedent NRC-approved license amendments exist for this refueling interlock TS change as referenced in Section 9.0.

4.0 Regulatory Requirements and Guidance

Refueling equipment interlocks restrict the operation of the refueling equipment or the withdrawal of control rods to reinforce plant procedures in preventing the reactor from achieving criticality during refueling. The control rods, when fully inserted, serve as the system capable of maintaining the reactor subcritical in cold conditions during all fuel movement activities and accidents, as prescribed by General Design Criterion (GDC) 26 of 10 CFR 50, Appendix A.

This TS change provides that, in the event of the inoperability of the refueling interlocks, that fuel movement may continue if all control rods are verified to be fully inserted and a rod block is inserted. These alternative actions equivalently satisfy the safety objective of maintaining the reactor subcritical in cold conditions during all fuel movement activities and accidents by verifying all rods are fully inserted and by inserting a rod block to prohibit control rod withdrawal.

5.0 Technical Analysis

The following provide input to the refueling interlock instrumentation: 1) the position of the refueling platform and grapple, 2) the loading of the refueling platform and service hoists, and 3) the full insertion of all control rods. Criticality is prevented during the loading of fuel provided all control rods are fully inserted. The refueling equipment interlocks accomplish this by preventing loading fuel into the core with any control rod withdrawn, or by preventing withdrawal of a control rod from the core during fuel loading. To prevent these criticality conditions from developing, the all-rods-in signal, the refueling platform position, and the refueling platform hoists and service platform fuel loaded inputs are required to be OPERABLE by TS 3.9.1. These inputs are combined in logic circuits that provide refueling equipment interlocks or control rod blocks to prevent operations that could result in criticality during refueling operations.

As discussed in the Bases for current TS Required Action 3.9.A.1, the purpose of the requirement (to suspend in-vessel fuel movement) is to ensure that operations are not performed with equipment that would potentially not be blocked from unacceptable operations (e.g., loading fuel into a cell with a control rod withdrawn). The method that the refueling equipment interlocks use to perform their function is to block control rod withdrawal whenever fuel is

being moved over or in the reactor vessel. Conversely, when a control rod is withdrawn, the refueling interlocks prevent fuel from being moved over or in the vessel. Basically, operable refueling interlocks permit fuel loading to proceed without the need to have a control rod withdrawal block in effect at all times.

As discussed above, the first refueling equipment interlock safety function is to block control rod withdrawal whenever fuel is being moved over or in the reactor vessel. The new Required Action 3.9.1.A.2.1 will perform this function by requiring that a control rod block be placed in effect continuously.

The second refueling equipment interlock safety function (hoists loaded) is to prevent fuel from being loaded into the vessel when a control rod is withdrawn. This function will continue to be performed by the proposed alternate Required Actions in 3.9.1.A.2. Required Action 3.9.1.A.2.1 will require that a control rod block first be placed in effect, thereby ensuring that control rods are not subsequently inappropriately withdrawn. In addition, Required Action 3.9.1.A.2.2 will require that all control rods be verified to be fully inserted. This verification is in addition to the periodic requirement to verify control rod position every 12 hours specified in SR 3.9.3.1. These proposed Required Actions will ensure that control rods are not withdrawn and cannot be inappropriately withdrawn, because an electrical or hydraulic block to prevent control rod withdrawal will be in place. Like Required Action 3.9.1.A.1, proposed Actions 3.9.1.A.2.1 and 3.9.1.A.2.2 will ensure that unacceptable operations are blocked (e.g., loading fuel into a cell with a control rod withdrawn). Hence, the misloading of fuel in cells with control rods withdrawn or rod withdrawal during fuel loading is equivalently prevented.

The proposed Required Actions also increase consistency within the TS, since they are similar to the Required Actions for the existing LCO in TS 3.9.4, Control Rod Position Indication. LCO 3.9.4 controls the operability of the control rod position indicators, which serve a support system role for the refueling interlocks controlled by LCO 3.9.1 (the rod position indicators provide information to the all-rods-in interlock). LCO 3.9.4 requires that when one or more control rods do not have the required position indication OPERABLE, that either all the insertable control rods be inserted and fuel movement and control rod withdrawal be suspended (Required Actions 3.9.4.A.1.1, -A.1.2 and -A.1.3), or, that the associated control rod(s) be

inserted and disarmed (Required Actions 3.9.4.A.2.1 and -A.2.2). The key is that if Required Actions 3.9.4.A.2.1 and -A.2.2 are complied with, then refueling activities can continue. The proposed LCO 3.9.1 Required Actions are consistent with the current Required Actions of LCO 3.9.4 in that they likewise require either fuel movement be suspended (similar to Required Action 3.9.1.A.1), or that all control rods required to be inserted be verified to be inserted and that control rod withdrawal be blocked (similar to the new TS 3.9.1.A.2 Required Actions).

6.0 Regulatory Analysis

This TS changes revises the operability requirements for the refueling equipment interlocks in TS LCO 3.9.1. Specifically, the proposed change will add alternative Required Actions for the condition when the LCO requirement that the refueling interlocks be OPERABLE during in-vessel fuel movement cannot be met. The new TS 3.9.1 Required Actions would be to suspend fuel movement or alternatively, immediately insert a control rod withdrawal block and verify all control rods are fully inserted. This change is acceptable since these alternative Required Actions equivalently satisfy the safety objective of maintaining the reactor subcritical in cold conditions during in-vessel fuel movement activities and for analyzed events by verifying all rods are fully inserted and by inserting a rod block, prohibiting control rod withdrawal.

If an equipment problem renders any of the refueling interlocks inoperable, the proposed TS change would provide an option to defer corrective maintenance by equivalently enforcing the refueling interlocks using the new alternate Required Actions. Similarly, if performance of SR 3.9.1 (Refueling Equipment Interlock Channel Functional Test) came due during fuel movement activities, the TS change would also allow declaring the refueling interlocks inoperable because of the overdue SR, using the new 3.9.1.A.2 Required Actions to equivalently enforce the refueling interlocks, and then continuing fuel movement. This has the benefit of not interrupting a critical path evolution such as fuel movement and reduces the risk of stopping and restarting fuel handling activities.

In summary, the proposed TS change provides equivalent protection against inadvertent criticality equal to that provided when the interlocks are OPERABLE, and is, therefore, acceptable.

7.0 No Significant Hazards Consideration

TVA is submitting a request for an amendment to the Browns Ferry Nuclear Plant (BFN) Units 1, 2, and 3 Technical Specifications (TS) to add alternate Required Actions to Technical Specification 3.9.1, Refueling Equipment Interlocks, for the condition when the refueling interlocks are inoperable.

TVA has concluded that operation of BFN Units 1, 2, and 3 in accordance with the proposed change to the TS does not involve a significant hazards consideration. TVA's conclusion is based on its evaluation, in accordance with 10 CFR 50.91(a)(1), of the three standards set forth in 10 CFR 50.92(c).

1. **The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.**

   The operation of refueling interlocks is explicitly assumed in the analyses of the control rod removal error and fuel loading error during refueling. Inadvertent criticality is prevented during the loading of fuel provided all control rods are fully inserted. The refueling interlocks accomplish this by preventing the loading of fuel into the core with any control rod withdrawn, or by preventing withdrawal of a rod from the core during fuel loading. Under existing TS when the refueling interlocks are inoperable, the current method of preventing fuel loading with control rods withdrawn is to prevent fuel movement. An alternate method to ensure that fuel is not loaded into a cell with a control rod withdrawn is to prevent control rods from being withdrawn and to verify that all control rods are fully inserted. The proposed TS Required Actions will require that a control rod block be placed in effect, thereby ensuring that control rods are not subsequently inappropriately withdrawn, and that all required control rods be verified to be fully inserted. This verification is in addition to the requirements to periodically verify control rod position by other TS requirements.

   These proposed actions will ensure that control rods are not withdrawn and cannot be inappropriately withdrawn, because a control rod withdrawal block is in place. Like the current TS requirements, the proposed actions will ensure that unacceptable operations are blocked. Hence, the proposed additional Required

Actions provide an equivalent level of assurance that fuel will not be loaded into a core cell with a control rod withdrawn as does the current TS Required Action. Therefore, the proposed change does not significantly increase the probability or consequences of an accident previously evaluated.

2. **The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.**

The change in the TS requirements does not involve a change in plant design or to the analyzed condition of the reactor core during refueling. The proposed new Required Actions will ensure that control rods are not withdrawn and cannot be inappropriately withdrawn, because a block to control rod withdrawal is in place. Therefore, no new failure modes are introduced, and the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **The proposed amendment does not involve a significant reduction in a margin of safety.**

As discussed in the Bases for the affected TS requirements, inadvertent criticality is prevented during the loading of fuel provided all control rods are fully inserted during the fuel insertion. The refueling interlocks function to support the refueling procedures by preventing control rod withdrawal during fuel movement and the inadvertent loading of fuel when a control rod is withdrawn. The proposed change will allow the refueling interlocks to be inoperable and fuel movement to continue only if a control rod withdrawal block is in effect and all control rods are verified to be fully inserted. These proposed Required Actions provide an equivalent level of protection as the refueling interlocks by preventing a configuration which could lead to an inadvertent criticality event. The refueling procedures will continue to be supported by the proposed Required Actions because control rods cannot be withdrawn and as a result, fuel cannot be inadvertently loaded when a control rod is withdrawn. Therefore, the proposed changes do not result in a significant reduction in the margin of safety.

8.0 Environmental Consideration

The proposed TS changes do not involve a significant hazards consideration, a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or a significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed amendment is not required.

9.0 Precedents

NRC has previously approved a Perry Nuclear Power Plant TS change which added the same two alternative Required Actions to TS 3.9.1 as documented in NRC Safety Evaluation Report (SER) dated September 12, 2000 (Reference 2). Generic TS change, TSTF-225 Revision 1, to NUREG-1433, which was based on the subject Perry TS change, was later transmitted to NRC by Reference 1. Revision 1 of the TSTF also proposes that the frequency for SR 3.9.1.1 be extended from 7 days to 30 days.

NRC indicated the acceptability of the Perry version of TSTF-225 in a letter dated September 12, 2000, to Commonwealth Edison for Dresden Nuclear Power Station, LaSalle County Station, and Quad Cities Nuclear Power Station (Reference 3). Dresden, LaSalle, and Quad Cities did incorporate the TS change during their conversion effort to improved TS earlier this year. Vermont Yankee Nuclear Power Station has also recently received NRC approval of the same TS change to their custom format TS (Reference 4).

This proposed BFN TS change is the same as that approved for Perry and submitted in TSTF-225 Revision 1 (without the 30-day SR extension). Since NRC review of TSTF-225 Revision 1 is still outstanding, BFN is not requesting adoption of the 30-day SR provision at this time. The revised BFN TS Bases provided in this change package have been modified slightly from those proposed in TSTF-225 Revision 1 to improve readability and are based on the corresponding Quad Cities TS Bases.

10. References

1. November 22, 2000, letter from NEI to NRC - Transmits TSTF-225 Revision 1 (ML003771365)

2. NRC SER dated September 12, 2000, for Perry Nuclear Power Plant, Refueling Equipment Interlocks (ML003750000)

3. NRC letter dated September 12, 2000, to Commonwealth Edison - Dresden, LaSalle, and Quad Cities Plants (ML003750177)

4. NRC SER dated April 21, 2001, for Vermont Yankee, Refueling Interlocks (ML010810449).

Attachment 2

TS-412

Fuel Movement with Inoperable Refueling Equipment Interlocks Marked-up TS Pages

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I. Affected Page List

Unit 1	Unit 2	Unit 3
3.9-1	3.9-1	3.9-1
B 3.9-4	B 3.9-4	B 3.9-4

II. Marked-up TS/TS Base Pages follow. The identical changes apply to all three BFN TS.

3.9 REFUELING OPERATIONS

3.9.1 Refueling Equipment Interlocks

LCO 3.9.1 The refueling equipment interlocks shall be OPERABLE.

APPLICABILITY: During in-vessel fuel movement with equipment associated with the interlocks.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required refueling equipment interlocks inoperable.	A.1 Suspend in-vessel fuel movement with equipment associated with the inoperable interlock(s).	Immediately
	OR	
	A.2.1 Insert a control rod withdrawal block	Immediately
	AND	
	A.2.2 Verify all control rods are fully inserted.	Immediately

BASES (continued)

APPLICABILITY

In MODE 5, a prompt reactivity excursion could cause fuel damage and subsequent release of radioactive material to the environment. The refueling equipment interlocks protect against prompt reactivity excursions during MODE 5. The interlocks are required to be OPERABLE during in-vessel fuel movement with refueling equipment associated with the interlocks.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and in-vessel fuel movements are not possible. Therefore, the refueling interlocks are not required to be OPERABLE in these MODES.

ACTIONS

A.1, A.2.1, and A.2.2

With one or more of the required refueling equipment interlocks inoperable, the unit must be placed in a condition in which the LCO does not apply. In-vessel fuel movement with the affected refueling equipment must be immediately suspended. This action ensures that operations are not performed with equipment that would potentially not be blocked from unacceptable operations (e.g., loading fuel into a cell with a control rod withdrawn). Suspension of in-vessel fuel movement shall not preclude completion of movement of a component to a safe position.

This can be performed by ensuring fuel assemblies are not moved in the reactor vessel or by ensuring that the control rods are inserted and cannot be withdrawn. Therefore, Required Action A.1 requires that

Alternatively, Required Actions A.2.1 and A.2.2 require a control rod withdrawal block to be inserted, and all control rods to be subsequently verified to be fully inserted. Required Action A.2.1 ensures no control rods can be withdrawn, because a block to control rod withdrawal is in place. The withdrawal block utilized must ensure that if rod withdrawal is requested, the rod will not respond (i.e., it will remain inserted). Required Action A.2.2 is normally performed after placing the rod withdrawal block in effect, and provides a verification that all control rods are fully inserted. This verification that all control rods are fully inserted is in addition to the periodic verifications required by SR 3.9.3.1. Like Required Action A.1, Required Actions A.2.1 and A.2.2 ensure unacceptable operations are blocked (e.g., loading fuel into a cell with the control rod withdrawn).

(continued)

3.9 REFUELING OPERATIONS

3.9.1 Refueling Equipment Interlocks

LCO 3.9.1 The refueling equipment interlocks shall be OPERABLE.

APPLICABILITY: During in-vessel fuel movement with equipment associated with the interlocks.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required refueling equipment interlocks inoperable.	A.1 Suspend in-vessel fuel movement with equipment associated with the inoperable interlock(s).	Immediately
	OR	
	A.2.1 Insert a control rod withdrawal block	Immediately
	AND	
	A.2.2 Verify all control rods are fully inserted.	Immediately

BASES (continued)

APPLICABILITY

In MODE 5, a prompt reactivity excursion could cause fuel damage and subsequent release of radioactive material to the environment. The refueling equipment interlocks protect against prompt reactivity excursions during MODE 5. The interlocks are required to be OPERABLE during in-vessel fuel movement with refueling equipment associated with the interlocks.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and in-vessel fuel movements are not possible. Therefore, the refueling interlocks are not required to be OPERABLE in these MODES.

ACTIONS

A.1, A.2.1, and A.2.2

With one or more of the required refueling equipment interlocks inoperable, the unit must be placed in a condition in which the LCO does not apply. In-vessel fuel movement with the affected refueling equipment must be immediately suspended. This action ensures that operations are not performed with equipment that would potentially not be blocked from unacceptable operations (e.g., loading fuel into a cell with a control rod withdrawn). Suspension of in-vessel fuel movement shall not preclude completion of movement of a component to a safe position.

This can be performed by ensuring fuel assemblies are not moved in the reactor vessel or by ensuring that the control rods are inserted and cannot be withdrawn. Therefore, Required Action A.1 requires that

Alternatively, Required Actions A.2.1 and A.2.2 require a control rod withdrawal block to be inserted, and all control rods to be subsequently verified to be fully inserted. Required Action A.2.1 ensures no control rods can be withdrawn, because a block to control rod withdrawal is in place. The withdrawal block utilized must ensure that if rod withdrawal is requested, the rod will not respond (i.e., it will remain inserted). Required Action A.2.2 is normally performed after placing the rod withdrawal block in effect, and provides a verification that all control rods are fully inserted. This verification that all control rods are fully inserted is in addition to the periodic verifications required by SR 3.9.3.1. Like Required Action A.1, Required Actions A.2.1 and A.2.2 ensure unacceptable operations are blocked (e.g., loading fuel into a cell with the control rod withdrawn).

(continued)

3.9 REFUELING OPERATIONS

3.9.1 Refueling Equipment Interlocks

LCO 3.9.1 The refueling equipment interlocks shall be OPERABLE.

APPLICABILITY: During in-vessel fuel movement with equipment associated with the interlocks.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required refueling equipment interlocks inoperable.	A.1 Suspend in-vessel fuel movement with equipment associated with the inoperable interlock(s).	Immediately
	OR	
	A.2.1 Insert a control rod withdrawal block	Immediately
	AND	
	A.2.2 Verify all control rods are fully inserted.	Immediately

BASES (continued)

APPLICABILITY

In MODE 5, a prompt reactivity excursion could cause fuel damage and subsequent release of radioactive material to the environment. The refueling equipment interlocks protect against prompt reactivity excursions during MODE 5. The interlocks are required to be OPERABLE during in-vessel fuel movement with refueling equipment associated with the interlocks.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and in-vessel fuel movements are not possible. Therefore, the refueling interlocks are not required to be OPERABLE in these MODES.

ACTIONS

A.1, A.2.1, and A.2.2

With one or more of the required refueling equipment interlocks inoperable, the unit must be placed in a condition in which the LCO does not apply. In-vessel fuel movement with the affected refueling equipment must be immediately suspended. This action ensures that operations are not performed with equipment that would potentially not be blocked from unacceptable operations (e.g., loading fuel into a cell with a control rod withdrawn). Suspension of in-vessel fuel movement shall not preclude completion of movement of a component to a safe position.

This can be performed by ensuring fuel assemblies are not moved in the reactor vessel or by ensuring that the control rods are inserted and cannot be withdrawn. Therefore, Required Action A.1 requires that

Alternatively, Required Actions A.2.1 and A.2.2 require a control rod withdrawal block to be inserted, and all control rods to be subsequently verified to be fully inserted. Required Action A.2.1 ensures no control rods can be withdrawn, because a block to control rod withdrawal is in place. The withdrawal block utilized must ensure that if rod withdrawal is requested, the rod will not respond (i.e., it will remain inserted). Required Action A.2.2 is normally performed after placing the rod withdrawal block in effect, and provides a verification that all control rods are fully inserted. This verification that all control rods are fully inserted is in addition to the periodic verifications required by SR 3.9.3.1. Like Required Action A.1, Required Actions A.2.1 and A.2.2 ensure unacceptable operations are blocked (e.g., loading fuel into a cell with the control rod withdrawn).

(continued)

Attachment 3

TS-412

Fuel Movement with Inoperable Refueling Equipment Interlocks Retyped TS/Bases Pages

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I. Affected Page List

Unit 1	Unit 2	Unit 3
3.9-1	3.9-1	3.9-1
B 3.9-4	B 3.9-4	B 3.9-4
B 3.9-5	B 3.9-5	B 3.9-5

II. BFN Units 1, 2, and 3 retyped TS/TS Base Pages follow.

3.9 REFUELING OPERATIONS

3.9.1 Refueling Equipment Interlocks

LCO 3.9.1 The refueling equipment interlocks shall be OPERABLE.

APPLICABILITY: During in-vessel fuel movement with equipment associated with the interlocks.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required refueling equipment interlocks inoperable.	A.1 Suspend in-vessel fuel movement with equipment associated with the inoperable interlock(s).	Immediately
	OR	
	A.2.1 Insert a control rod withdrawal block.	Immediately
	AND	
	A.2.2 Verify all control rods are fully inserted.	Immediately

BASES (continued)

APPLICABILITY

In MODE 5, a prompt reactivity excursion could cause fuel damage and subsequent release of radioactive material to the environment. The refueling equipment interlocks protect against prompt reactivity excursions during MODE 5. The interlocks are required to be OPERABLE during in-vessel fuel movement with refueling equipment associated with the interlocks.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and in-vessel fuel movements are not possible. Therefore, the refueling interlocks are not required to be OPERABLE in these MODES.

ACTIONS

A.1, A.2.1, and A.2.2

With one or more of the required refueling equipment interlocks inoperable, the unit must be placed in a condition in which the LCO does not apply. This can be performed by ensuring fuel assemblies are not moved in the reactor vessel or by ensuring that the control rods are inserted and cannot be withdrawn. Therefore, Required Action A.1 requires that in-vessel fuel movement with the affected refueling equipment must be immediately suspended. This action ensures that operations are not performed with equipment that would potentially not be blocked from unacceptable operations (e.g., loading fuel into a cell with a control rod withdrawn). Suspension of in-vessel fuel movement shall not preclude completion of movement of a component to a safe position. Alternatively, Required Actions A.2.1 and A.2.2 require a control rod withdrawal block to be inserted, and all control rods to be subsequently verified to be fully inserted. Required Action A.2.1 ensures no control rods can be withdrawn, because a block to control rod withdrawal is in place. The withdrawal block utilized must ensure that if rod withdrawal is requested, the rod will not respond (i.e., it will

(continued)

BASES

ACTIONS

A.1, A.2.1, and A.2.2 (continued)

remain inserted). Required Action A.2.2 is normally performed after placing the rod withdrawal block in effect, and provides a verification that all control rods are fully inserted. This verification that all control rods are fully inserted is in addition to the periodic verifications required by SR 3.9.3.1. Like Required Action A.1, Required Actions A.2.1 and A.2.2 ensure unacceptable operations are blocked (e.g., loading fuel into a cell with the control rod withdrawn).

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

Performance of a CHANNEL FUNCTIONAL TEST demonstrates each required refueling equipment interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested. This SR is only required for refueling equipment in use.

The 7 day Frequency is based on engineering judgment and is considered adequate in view of other indications of refueling interlocks and their associated input status that are available to unit operations personnel.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Section 7.6.3.
3. FSAR, Section 14.5.3.3.
4. FSAR, Section 14.5.3.4.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

3.9 REFUELING OPERATIONS

3.9.1 Refueling Equipment Interlocks

LCO 3.9.1 The refueling equipment interlocks shall be OPERABLE.

APPLICABILITY: During in-vessel fuel movement with equipment associated with the interlocks.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required refueling equipment interlocks inoperable.	A.1 Suspend in-vessel fuel movement with equipment associated with the inoperable interlock(s).	Immediately
	OR	
	A.2.1 Insert a control rod withdrawal block.	Immediately
	AND	
	A.2.2 Verify all control rods are fully inserted.	Immediately

BASES (continued)

APPLICABILITY

In MODE 5, a prompt reactivity excursion could cause fuel damage and subsequent release of radioactive material to the environment. The refueling equipment interlocks protect against prompt reactivity excursions during MODE 5. The interlocks are required to be OPERABLE during in-vessel fuel movement with refueling equipment associated with the interlocks.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and in-vessel fuel movements are not possible. Therefore, the refueling interlocks are not required to be OPERABLE in these MODES.

ACTIONS

A.1, A.2.1, and A.2.2

With one or more of the required refueling equipment interlocks inoperable, the unit must be placed in a condition in which the LCO does not apply. This can be performed by ensuring fuel assemblies are not moved in the reactor vessel or by ensuring that the control rods are inserted and cannot be withdrawn. Therefore, Required Action A.1 requires that in-vessel fuel movement with the affected refueling equipment must be immediately suspended. This action ensures that operations are not performed with equipment that would potentially not be blocked from unacceptable operations (e.g., loading fuel into a cell with a control rod withdrawn). Suspension of in-vessel fuel movement shall not preclude completion of movement of a component to a safe position. Alternatively, Required Actions A.2.1 and A.2.2 require a control rod withdrawal block to be inserted, and all control rods to be subsequently verified to be fully inserted. Required Action A.2.1 ensures no control rods can be withdrawn, because a block to control rod withdrawal is in place. The withdrawal block utilized must ensure that if rod withdrawal is requested, the rod will not respond (i.e., it will

(continued)

BASES

ACTIONS

A.1, A.2.1, and A.2.2 (continued)

remain inserted). Required Action A.2.2 is normally performed after placing the rod withdrawal block in effect, and provides a verification that all control rods are fully inserted. This verification that all control rods are fully inserted is in addition to the periodic verifications required by SR 3.9.3.1. Like Required Action A.1, Required Actions A.2.1 and A.2.2 ensure unacceptable operations are blocked (e.g., loading fuel into a cell with the control rod withdrawn).

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

Performance of a CHANNEL FUNCTIONAL TEST demonstrates each required refueling equipment interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested. This SR is only required for refueling equipment in use.

The 7 day Frequency is based on engineering judgment and is considered adequate in view of other indications of refueling interlocks and their associated input status that are available to unit operations personnel.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Section 7.6.3.
3. FSAR, Section 14.5.3.3.
4. FSAR, Section 14.5.3.4.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

3.9 REFUELING OPERATIONS

3.9.1 Refueling Equipment Interlocks

LCO 3.9.1 The refueling equipment interlocks shall be OPERABLE.

APPLICABILITY: During in-vessel fuel movement with equipment associated with the interlocks.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required refueling equipment interlocks inoperable.	A.1 Suspend in-vessel fuel movement with equipment associated with the inoperable interlock(s).	Immediately
	OR	
	A.2.1 Insert a control rod withdrawal block.	Immediately
	AND	
	A.2.2 Verify all control rods are fully inserted.	Immediately

BASES (continued)

APPLICABILITY

In MODE 5, a prompt reactivity excursion could cause fuel damage and subsequent release of radioactive material to the environment. The refueling equipment interlocks protect against prompt reactivity excursions during MODE 5. The interlocks are required to be OPERABLE during in-vessel fuel movement with refueling equipment associated with the interlocks.

In MODES 1, 2, 3, and 4, the reactor pressure vessel head is on, and in-vessel fuel movements are not possible. Therefore, the refueling interlocks are not required to be OPERABLE in these MODES.

ACTIONS

A.1, A.2.1, and A.2.2

With one or more of the required refueling equipment interlocks inoperable, the unit must be placed in a condition in which the LCO does not apply. This can be performed by ensuring fuel assemblies are not moved in the reactor vessel or by ensuring that the control rods are inserted and cannot be withdrawn. Therefore, Required Action A.1 requires that in-vessel fuel movement with the affected refueling equipment must be immediately suspended. This action ensures that operations are not performed with equipment that would potentially not be blocked from unacceptable operations (e.g., loading fuel into a cell with a control rod withdrawn). Suspension of in-vessel fuel movement shall not preclude completion of movement of a component to a safe position. Alternatively, Required Actions A.2.1 and A.2.2 require a control rod withdrawal block to be inserted, and all control rods to be subsequently verified to be fully inserted. Required Action A.2.1 ensures no control rods can be withdrawn, because a block to control rod withdrawal is in place. The withdrawal block utilized must ensure that if rod withdrawal is requested, the rod will not respond (i.e., it will

(continued)

BASES

ACTIONS

A.1, A.2.1, and A.2.2 (continued)

remain inserted). Required Action A.2.2 is normally performed after placing the rod withdrawal block in effect, and provides a verification that all control rods are fully inserted. This verification that all control rods are fully inserted is in addition to the periodic verifications required by SR 3.9.3.1. Like Required Action A.1, Required Actions A.2.1 and A.2.2 ensure unacceptable operations are blocked (e.g., loading fuel into a cell with the control rod withdrawn).

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

Performance of a CHANNEL FUNCTIONAL TEST demonstrates each required refueling equipment interlock will function properly when a simulated or actual signal indicative of a required condition is injected into the logic. The CHANNEL FUNCTIONAL TEST may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is tested. This SR is only required for refueling equipment in use.

The 7 day Frequency is based on engineering judgment and is considered adequate in view of other indications of refueling interlocks and their associated input status that are available to unit operations personnel.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 26.
2. FSAR, Section 7.6.3.
3. FSAR, Section 14.5.3.3.
4. FSAR, Section 14.5.3.4.
5. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.